

forming a bonded portion by making use of the deformation of each sheared surface to be generated during the shearing process;

wherein the bonded portion or bonded surface of the bonded portion is formed in an oblique direction inclined with respect to the thickness direction of the metal plates.

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2. (AMENDED) A method of bonding metal plates according to Claim 1; wherein the inclination angle of the bonded portion or bonded surface is 75 degrees or less.

(A copy of the marked-up version of amended Claims 1 and 2 are attached to this Amendment.)

Please ADD new Claims 47-49 as follows:

-- 47. (NEW) A method of bonding metal plates comprising the steps of:
applying first and second shearing blades of specific shape onto respective upper and lower sides of overlapped metal plates so as to sandwich the overlapped portion during a shearing process; and forming a bonded portion by making use of the deformation of each sheared surface to be generated during the shearing process;

wherein the bonded portion or bonded surface of the bonded portion is formed in an oblique direction inclined with respect to the thickness direction of the metal plates.

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48. (NEW) A method of bonding metal plates according to Claim 47, wherein the inclination angle of the bonded portion or bonded surface is 75 degrees or less.

49. (NEW) A method of bonding metal plates comprising the steps of:
applying first and second shearing blades of specific shape onto respective upper and lower sides of overlapped metal plates so as to sandwich the overlapped portion during a shearing process; and forming a bonded portion by making use of the deformation of each sheared surface to be generated during the shearing process;

wherein the bonded portion or bonded surface of the bonded portion is formed in an oblique direction inclined with respect to the thickness direction of the metal plates;

wherein the first and second shearing blades are moved in opposing directions so as to avoid deformation of the metal plates.--

REMARKS

Reconsideration and allowance of this application are respectfully requested in view of the above amendment and discussion below.

Applicants' invention, as defined by independent Claims 1 and 47, is addressed to a method of bonding multiple metal plates and particularly bonding

hot rolled strips. According to the present invention, it is possible to bond the hot rolled strips in a short time and perform continuous rolling when these hot strips are being rolled by a set of finish rolling mills.

With the method of the present invention, a pressing force, which presses the sheared surfaces onto each other, is generated in a shearing process and a bonded portion is compressed allowing for an improved bonding strength and a shortening in the bonding time. Because the shearing blades are on each side of the plates, opposite each other, and because they are moved in a relative manner, it is possible to not only shorten the bonding time but to prevent deformation of the metal plates after bonding, as is discussed at page 43, lines 4-17 of the specification.

Additionally, the upper and lower shearing blades are moved in the opposite direction to each other in order to avoid deformation of the metals. The shearing blades are installed on both sides of the overlapped metal in order to act as a support so that no other supporting device is necessary. As a result, the crop length can be shortened and deformation is prevented, which results in the efficiency or improvement in the motion of the metal plate.

Claims 1 and 2 have been rejected under 35 U.S.C. § 102 as anticipated by each of the reference to Kajiwara et al., U.S. Patent No. 5,234,154, and Funamoto et al., U.S. Patent No. 6,213,381, as indicated at item 4 of the Patent Office Action.

Applicants respectfully traverse this rejection on the grounds that independent Claims 1, 47 and 49 provide a method which is not shown or disclosed or made obvious by any of the references of record.

The reference to Kajiwara et al. '154 has a trailing end of one bar arranged at an angle relative to the next bar in the process so that the lower edge of the leading end face of a following bar is vertically shifted from the lower edge of the trailing end face of the leading bar with the leading end face of the trailing bar abutting the trailing end of the preceding bar, as is shown in the Figures 1A-1C of the '154 reference. As a result, the '154 reference to Kajiwara et al. has no disclosure concerning the method of bonding overlapped metal plates during the shearing process, as is specifically claimed in each of independent Claims 1, 47 and 49.

The reference to Funamoto et al. has a leading sheet bar and a following sheet bar which are overlapped with the two sheet bars being sheared at the same time. Clean surfaces are brought into direct contact with each other in order to provide stronger metal bonding. Funamoto et al. has a shearing blade with a clamp on one side and a support on the other side with two overlapped bars being clamped by the support and the clamp, and with the shearing blade 8 operated to form clean bonding surfaces. Funamoto et al., however, must have sufficient bonding strength during a short time while keeping deformation or bending of the bonded metal plates to a minimum. The remaining crop after

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bonding is lengthened because the material is clamped by the support side with the clamping mechanism 7 and the lower blade 9. Furthermore, the plate movability of Funamoto et al. is reduced because the plates 1 are bent toward the support side as discussed at page 3, line 17, to page 4, line 1 of the present application, which discusses Japanese Laid Open Publication 09/174117, which corresponds to U.S. Patent No. 5,884,832 having the same disclosure as U.S. Patent No. 6,213,381 as a result of being a divisional of this Funamoto U.S. patent.

For these reasons, the cited reference to Funamoto et al. has no disclosure of the present invention with respect to upper and lower shearing blades positioned on respective sides of the overlapped metal plates, as shown in Figure 1 of the present application. The upper metal plate 1 has an upper shearing blade 3 pressed against one side and a lower metal plate 2 with a lower shearing blade 4 pressed against the opposite side so that these upper and lower shearing blades 3 and 4 correspond to the "first and second shearing blades" applied on to "respective both sides of overlapped metal plate" according to the claimed invention defined by independent Claims 1, 47 and 49.

In response to the rejection of Claim 2 under 35 U.S.C. § 112, Applicants have made the appropriate change to line 3, as required.

Therefore, in view of the distinguishing features between the claimed invention and the references, which features are not shown or disclosed or made

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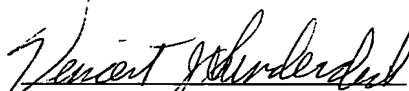
obvious by the references or their combination, Applicants respectfully requested that this application containing Claims 1-2 and 47-49 be allowed and be passed to issue.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket No. 381NT/49487).

Respectfully submitted,

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